

# Hypotheses on Cellular Perceptive Psychology

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## Abstract

The recognition of the whole shape of an object is a perception which requires a time dimension. This one allows, at time of event, an organism's 4D extension containing its form potentialities. Occurring in reaction to environment variations, unthinking behavior may result. In mathematical science, it is Analysis Situs, or general topology, which constitutes envelopment; which makes it possible to generate a *sense* in order to solve equations without traditional solutions. In biology, it is the 4D qualitative extension which forms an unthinking pattern-image in the organism. When this one becomes identical to a contribution of *sense*, an overall stress is exerted by the cell's psychical energetics upon orientation of the mechanical magnitudes and thus being upon modulation of the cellular signaling pathways. The bioelectromagnetic nature of the cell's relational energetics includes three terms: the biomagnetic suggestion L, the bioelectric excitation C, and their damping by the organic resistance R. These three aspects imply a temporal phase shift. As RLC resonance known from physics cancels this phase shift, a medical treatment of lesions by application of suitable electromagnetic waveforms appears to be possible.

## Keywords

*Cell Signaling Biology; Sense Order; Extension; Topology; Biomagnetic; Bioelectromagnetic; Magnetic Field; Behavior; Suggestion; Relational Energetics*

## Introduction to Cellular Perception

For animals, perception is derived from simple sensation through sensory stimulation and complex cognitional behavior. PW Nathan, (2011), said that it is biologically correct to be alarmed before one knows the reason. It is only after the immediate and automatic response that the cerebral cortex is involved and conscious perception begins.

Perception is then said to be recognition of a thing after sensory stimulation. And recognizing a thing entails the learning of its total shape, or pattern, or Gestalt.

This definition is logically imperfect because it takes part of the mind-body dualism resulting from Descartes, (1641), as quoted by Wilshire, (2012): who suggested that the stimuli act in the body and that the act of perception is held in fact in the mind, or the behavior, which ignores the bond between body and mind, i.e. the connection with existence in action which is external to any thought.

According to an equivalent definition, perception is the action by which a living organism can see the object which acts upon its sensory receptors. To see is a Cartesian idea here, because it suggests an existing mind, able to see the image formed in the subjective from an object in the world. Of course in a simple cell or in a plant, there is no neuronal structure allowing the formation of an image what a conscious mind could see. However the protozoon is able to locate a prey in an aqueous medium and to go there. This could be possible within some sensitive extension.

In a periodic electromagnetic signal, a local waveform appears at a given moment as if it has already known the total shape to come. The philosopher Merleau-Ponty, (1947), criticized the idea of total shape knowledge, as it is presented in the Gestalt theory. On the one hand, he specified that the physical substance of an electromagnetic device, or any physical system, knows nothing like that. In addition, he attested that each various moment traversed by a natural object is present to its previous and subsequent moments. That implies a time dimension operated with some temporal thickness.

The mind-body relationship can consequently be expressed as a dialectic of structures extended in the environment with some time component: The moment prior to present time is that of the mind which should be memorized, and the next moment is that of the physical body which is anticipated.

Mechanical description of biology refers to a leukocyte crossing the wall of a blood vessel and moving right on to a prey because it has received some stimuli which emanates from it. On this occasion, endothelial cells help it by losing their shape to let it go through. Moreover, under circumstances, this leukocyte can change attitude and become a macrophage. This cell thus receives a qualitative constraint coming from its living existence in its environment. It can be a non-mechanical constraint :

It is assumed that cellular perception is a biological phenomenon bringing into play a sensitive extension. This extension is a general property of the organisms. Its dimensions include those of living space in present time, plus that of time considered with the mass of memorized previous moments and the potentialities about moments to come. The resulting constraint is an adaptive reaction to environmental variations through relational energetics.

The physics related to this relational energetics is a naive physics, in the sense that the response of a living system to stimuli is non-linear. It is a switching response typical of open systems. It is all the more since events<sup>\*1</sup> in the medium are tested by living beings in a qualitative way. It could be applied for example to the attitudes and reactions of cells to events happening in their aqueous microenvironment.

Whitehead's philosophy of nature assumed in 1920 that extension is a fundamental property of organisms. Consequently the philosopher Barbaras indicated in 2000 that any organism has a potential being-envelope, which is related to its total form, [6]. This postulate makes possible to overcome the insurmountable logical difficulty, (the aporia,) inherent to Cartesian dualism: it makes possible the logical association, in the organism's perception of the role of the quantitative localized signal with the role played by the external qualitative topological structure whose nature is non-localized.

### Cellular Perception Features

Consequently, perception by a cellular organism associates the mechanical and quantitative role of the causal signal with the non-mechanical role of the substrate where the signaling process grows, which

relates to the qualitative and delocalized<sup>\*2</sup> overall information. This association of mechanical and non-mechanical forces in cellular signaling regulation is shown in Figure 1.

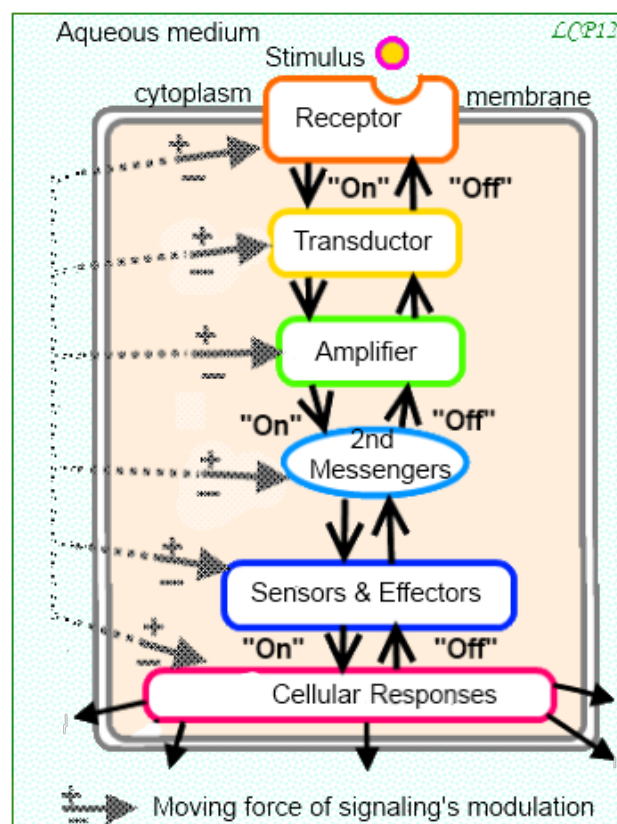


FIG 1 MODULATION OF THE CELLULAR SIGNALING PATH

THE CAUSAL MECHANICS OF THE SIGNALING PATH ARE SUBJECT TO MOVING FORCES WHICH MODULATE IT. THE ORIGIN OF THESE MODULATION FORCES CAN LIE IN OVERALL INFORMATION, OF A NON-MECHANICAL NATURE, WHICH IS A FUNCTION OF THE EVENTS IN THE MEDIUM.

This overall information exists at the time of the event, which results from the extension of the organism in its 4D environment, i.e. from the unfolding of its being-envelope which encounters the event. The time dimension  $t$  brings into play the overall history from the past living species to a possible future. It is the main dimension of the extension, as suggested in figure 2.

### Example Relating to the role of overall information:

Through the action of time, an entangled interaction appears between the individual genes of an organism, populations of genes related to the species which share the same ecological niche and relations between the

<sup>1</sup> *The event* is everything that happens and that forms an uninterrupted continuation in the environment of the life, while being liable or not to affect the present organisms.

<sup>2</sup> In chemistry, the word *delocalized* means: stripped of location and activity according to simple localization with 4 dimensions, but, however, present within totality.

various species, as Miquel, 2010, indicated. This fact is explained by the overall information which, little by little, with the unfolding of events, becomes functional within the system, however, complex it might be. Such overall information can also lead to an epigenetic remodeling. In 2009, Berger had revealed that this led to a stable and inheritable phenotype, resulting from the life which had been led in a given world.

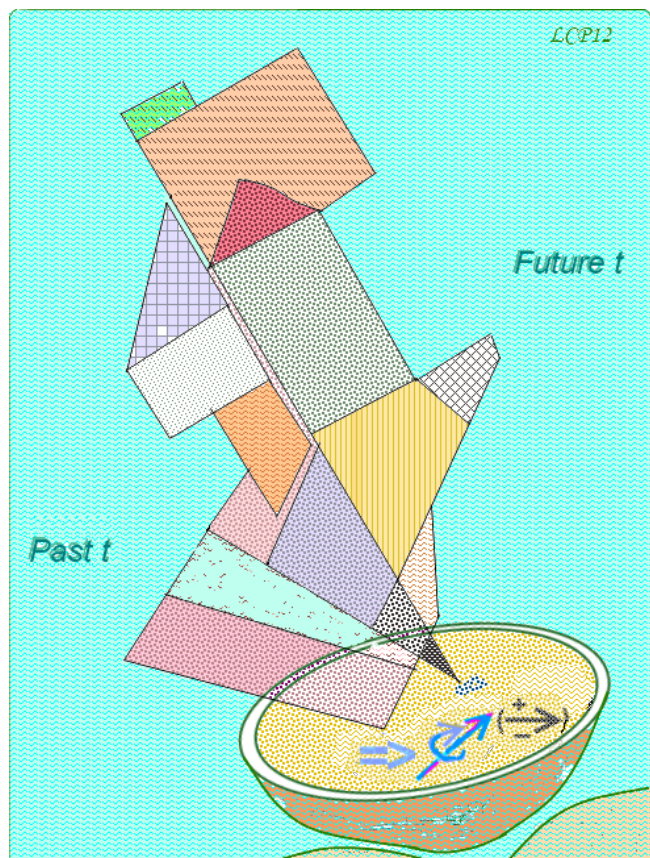


FIG 2 THE EXTENSION IN THE AQUEOUS MEDIUM

BETWEEN LIVED PAST AND POSSIBLE FUTURE, THE ALGEBRAIC EXTENSION  $X^Y Z^T$  CORRESPONDS TO A DEPLOYMENT OF THE BEING-ENVELOPE AT THE TIME OF EVENT. IT IS TRANSLATED INTO THE CELL BY AN OVERALL CONSTRAINT EXERTED UPON MOVING FORCES.

### Biological Integration (of the Event Occurring in the Aqueous Extracellular Medium)

In the reductionist description of biology, space and time are only conceptual extensions which do not take part in experienced life. According to these largely taught doctrines, an organism does not move freely, because it is moved by the effect of stimuli undergone. It is said that these stimuli form feelings which lead to mechanical perceptions. But such a description is contrary to biological reality. This is why systems biology analyzes mathematics how the participation of

the cell's micro-environment can be effective.

Thus Miquel reminded that the feedback loop, which forms the heart of the causal biocybernetic model, is logically valid only if the actions of the medium are commutative with those of the living organism. Insofar as the organism, (which can be a simple cell belonging to a tissue or a complex organism), has a biological reaction which comes from it, (which is *sui generis*), challenging any absolute mechanical submissiveness with feedback. It thus testifies that, through perception mechanism, an existing qualitative *sense order* can intervene on the mechanical *causality order*, (Barbaras, 2000, Thines, 2012).

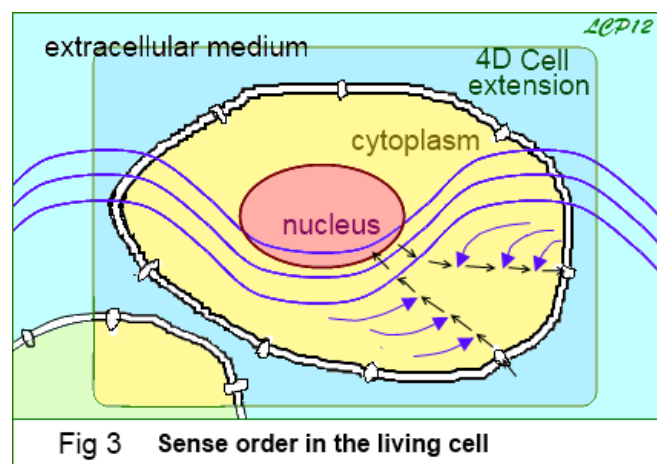
The biological integration of an external structure variation which forms an event is translated into a qualitative manner. This process does not necessarily need any contact of the mechanical or molecular stimulus with the membrane, or the skin, as Sherrington, (1906) showed. Biological integration proceeds by means of a 4 dimensional subjective space, known as *being-envelope*. Belonging to any organism existing in a medium, it unfolds with the event, according to a 4D extension.

The *being-envelope* consists of the total sum of the virtual existence forms. It is the total form, but hollow, in the negative. The bio-energy of its deployment results from the natural dialectical opposition between the pure instinct and the mass of possibilities, at the time of an event. According to Jung, 1923, the pure instinct, collective, impersonal and objective corresponds more to the body and to the next moment. On the contrary, the mass of possibilities is inherited starting from repetitions of the experiences of ancestors and species. It corresponds more to the spirit, and to the previous moments. The deployment of the *being-envelope* thus results in a naive choice of the form to be adopted, according to the structure of the event and the inherited mass. Meanwhile, starting from the cellular perception of an extracellular variation with a *sense*, a constraint of reorientation could apply to the moving forces of signaling modulation and bio-molecules within an overall *architectonic*<sup>3</sup> effect, as Le Chapellier, (2010) observed. This effect exists in reaction to the perceived *sense*.

The biological phenomenon of an event's integration

<sup>3</sup> *Architectonic*: Having an organized and unified structure

thus associates a 4D extension of the organism with a causal treatment of the molecular mechanical signals. The 4D extension is translated according to *sense order*. Molecular or mechanical reception of signals is translated according to *causality order*. Figure 3 presents this emergent concept.



### The Extension as an Analysis Situs

#### *Perceptive extension is an Envelopment.*

The *percept-image* that a living cell can acquire always results from *envelopment*. In 1679, Leibniz has been already seeking a "*situations geometry*" to supplement the algebraic analysis of Descartes and to represent "*all that depends on imagination*". In 1844, Grassmann winning a contest intended to advance on along this path and developed a mathematical theory of Extension. Thereafter this path became more general that of *Analysis Situs*, or general topology, as Le Chapellier, (2011) observed. "*Situation analysis*" is a mathematical tool of a topological nature invented by Poincaré in about 1890. This tool uses a logical *envelopment* to release a *sense* in order to contribute to solving differential equations without utilization of traditional solutions.

In biology, *extension*, or the unfolding of the organism's *being-envelope* at the time of an event, causes an unthinking or instinctive immediate image. Because it has not been thought out, this kind of image cannot be "*seen*" by any thinking mind. But it thus contributes to bringing *sense* which tends to architectonically constrain the moving forces within the cell. There follows an orientation stress applied to the modulation of the cellular signaling pathways. This modulation gives a "*solution*" to the question of the reactive adaptation of the cell to the environmental

conditions, according to the possible attitude, or potential, or status of the cell.

#### *Any Life Proceeds in a Psycho-physical World of Percept-images.*

The life of the cell proceeds as any life does, i.e. in a world of "*images*". This way, through the identity principle between the unconscious unthinking *image* and *sense* supplying to orientation, biological life is indissociable from the *unconscious organic psyche*. As Jung pointed out around 1933, this identity is such as that when the *image* is formed, the *sense* is clarified. It remains to be specified how the unconscious body covers and directs the objective magnitudes of the living biomaterial. (These magnitudes are those of the moving forces which modulate the cellular signaling pathways):

#### Assumption of Unthinking Psyche as a Corporeal Unconscious

The famous "*Cogito ergo sum*" of Descartes summarized that: "*To think, it is necessary to be.*" This implies that an unthinking state is prior to any thought. More generally, the unthinking psyche is prior to any thinking being. Such is the collective unconscious prior to the birth of any thinking being.

- At the cell organic level, the collective unconscious which relies only on the Life and Sense archetype can be named as *bodily*, or *corporeal*, *unconscious*.
- Unconscious cellular perception, while relying on the mathematical physics of extension, produces images and sense through the psychical energetics which relates with this unthinking psyche given the name corporeal unconscious. The existence of the corporeal unconscious is not known directly. Only its effects of architectonic scheduling in reaction to events in the 4D environment can be highlighted indirectly, within the life of the cell, or within the life of the complex organism.

#### Assumption about Cellular Psychical Energetics

According to the Depths Psychology of Jung, *psychical energetics* relies naturally on the creative conflict of two complementary-opposites and also associates two energy forms, potential energy and actual energy.



- The actual energy of psychical energetics is made up of psychic moving forces. In the zero-points of the intermolecular physical vacuum, they appear as equal and opposed to the physical forces of interaction and modulation. This creative opposition tends to exert a continuous local change. But this change ability is more or less effective, according to what the cell attitude or status is.
- The potential energy of the cellular psyche corresponds to the attitude, or condition, or status, or bio-availability of the cell. This potential is precisely equal to the sum of the cell's being and non-being.
- The cell's non-being is defined here according to Aristotelian ideas: It is not nothingness but is the 4D medium. It is the 4D environment of any possible movement of change, or evolution and includes potentialities coming from the mass inherited during past history and which preform all that the living being can become. See Figure 4.

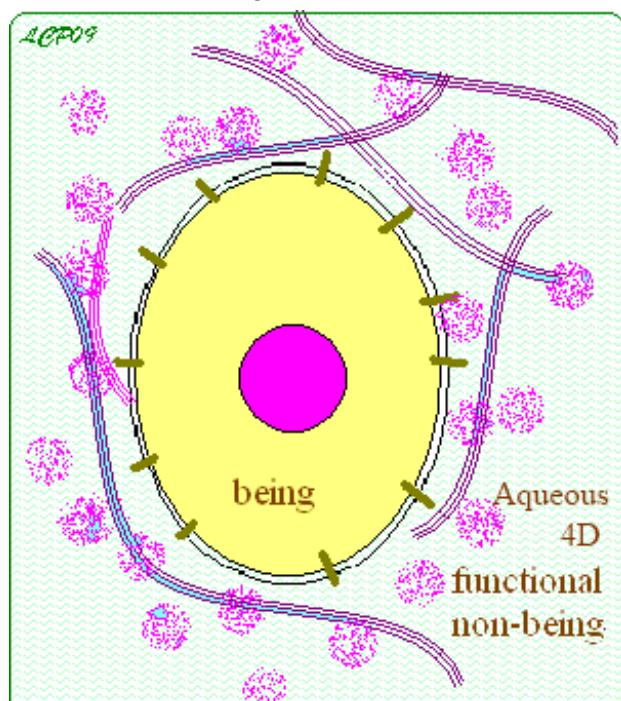


FIG 4 FUNCTIONAL NON-BEING OF THE LIVING CELL:

IT INCLUDES ITS RELATIONAL OTHERNESS, AS ITS POTENTIAL LIFE WITH ALL ITS POTENTIALITIES. THE SUM OF THE CELL'S BEING AND NON-BEING IS ASSUMED TO BE PRECISELY EQUAL TO THE CELLULAR PSYCHIC POTENTIAL.

### Short Bioelectromagnetic Description of the Cell's Relational Energetics

Because of evolution, a psychophysical parallel is

highly probable. Currently, matter is made up of protons, electrons and neutrons which have an ElectroMagnetic, EM, nature: As the  $H^+$  protons are paramagnetic, their wave structures are sensitive to the external Magnetic Field, MF. The  $e^-$  electrons are also paramagnetic but, as often as possible, they are paired, ( $e^- \uparrow \downarrow e^-$ ), so as to escape from the MF. As chemical life mainly consists of electrons exchanges, it is sensitive to, or excitable, in the electric field, EF. Lastly, once paired with the proton in the nucleus of atom, each neutron has a stabilization role which supplies some kind of inertia, or resistance to the fluctuations of the EM field.

By admitting the psychophysical parallel, the cell's *relational energetics* aspects can be similar to the respective activities of the protons, electrons and neutrons, as Le Chapellier, 2012, suggested:

- Biomagnetic Psychical Energy is physically related to protons structures and proton flows forming curled figures in the aqueous medium exposed to MF, as Pang, 2009, showed. It refers to images, then to sensitivity to patterns, or suggestion. Acceptance of the parallel leads to the hypothesis that unconscious suggestion is characterized with a psychic potential, (a cellular condition, or an organism attitude,) which is in advance of the real psychic moving forces.
- Bioelectric Psychical Energy, or Galvanization, refers to excitability triggered by ambient agents. Physically related to flows and exchanges of electrons, it includes chemotaxy and galvanotaxy. Psychically it corresponds to irritability in its relation with the medium agents. Acceptance of the parallel leads to the hypothesis that unconscious excitability-irritability is characterized with a psychic potential, (by a condition, or cellular status), which is delayed on the psychic moving forces that are actuated.
- Thirdly there is an Organic Resistance, or inertia, which dampens in real time all the EM influences to change. The physiopathological status of a lesion will thus express a resistance to the treatment, whether it is a suggestive treatment, (as effect of imagination force or placebo effect,) or an exciting-modulating treatment, (as a stimulating effect).

These three aspects of the cell's *Relational Energetics* result in a complex *temporal phase shift*, characterized

with a  $\phi$  angle, as shown in Fig 5.

This phase shift can be cancelled in the case of a resonant event's perception, as observed in the case of a RLC resonance, with R resistance, L inductance giving a lead, C capacitance giving a delay.

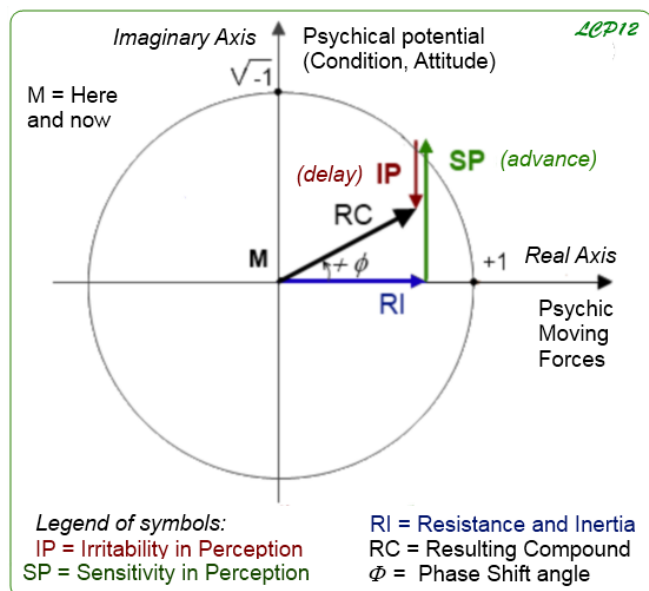


FIG 5 TEMPORAL PHASE SHIFT IN CELLULAR PSYCHOLOGY AFTER PERCEPTION OF AN EVENT

REPRESENTATION USES THE COMPLEX PLAN, WITH ITS IMAGINARY AND REAL AXIS. PSYCHIC MOVING FORCES ARE ON THE REAL AXIS, IN THE PRESENT TIME. PSYCHIC POTENTIAL ENERGY, OR CELL'S ATTITUDE, IS ON THE IMAGINARY AXIS. BY AN EFFECT OF SENSITIVITY IN PERCEPTION, SP, WHICH IS SUPPOSED TO BE OF A BIOMAGNETIC NATURE, THE CELL'S ATTITUDE COULD GET A LEAD ON THE MOVING FORCES. BY AN EFFECT OF IRRITABILITY IN PERCEPTION, IP, WHICH IS SUPPOSED TO BE OF A BIOELECTRIC NATURE, THE CELL'S ATTITUDE COULD GET A DELAY ON THE MOVING FORCES. ANGLE  $\phi$  INDICATES THE RESULTING PHASE SHIFT BETWEEN THE ACTIVE RESULTING COMPOUND RC AND THE PASSIVE RESISTANCE AND INERTIA, RI, OF THE CELL. A PSYCHICAL RESONANCE NULLS  $\phi$  AND THUS PERMITS A FULL EFFECTIVENESS OF THE PSYCHICAL MOVING FORCES.

## Conclusion

- Using stimulation by a suitable EM wave form, the advance in attitude due to suggestion can be compensated by the delay which is supplied by excitation, resulting in a resonance condition. This makes victory over the resistance of a physiopathological lesion without difficulty and helps to obtain a real curative change:
- Psychophysical parallel suggests that a physical bioelectromagnetic treatment, aimed at resonance and possibly coupled with a standard chemical treatment, can apply to the cell's psychical energetics, in order to exceed a physiopathological status<sub>7</sub> in a curative

direction.

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